

## REMARKS

### A. Request for Reconsideration

Applicant has carefully considered the matters raised by the Examiner in the outstanding Office Action but remains of the position that patentable subject matter is present. Applicant respectfully requests reconsideration of the Examiner's position based on the amendments to the claims and the following remarks.

### B. Claim Status and Amendments

Claims 4-7 and 9-10 are presented for further prosecution.

Claims 4-7 and 10 are amended to insert "elastomeric" before the term, "resin" to make it clear that the required resin is an elastomeric resin. These amendments are supported by the application e.g., at page 1, lines 5-9 and page 2, lines 9-10.

Claim 10 is also amended to correct an informality by removing extraneous underlining.

No new matter was added.

### C. The Invention

As previously explained, the present invention relates to an elastomeric compound having a high filler content of 15% to 500% by weight of the elastomeric resin, which additionally contains 1 to 400% by weight of the elastomeric resin, of microsilica as a modifier to improve the processability, and in particular, improve the viscosity.

As discussed in the specification, the "high filler loading" means an elastomeric compound having such a filler loading amount that the viscosity will increase to such a level that the compound can not be processed. The invention solves this processibility problem by adding 1 to 400 % by weight of microsilica to such a highly loaded elastomeric compounds already having a high filler content of 15% to 500% by weight, that produces an unexpectedly reduced viscosity, so that the high filler loading composition can continue to be processed.

The term "microsilica" used in the specification and claims is particulate amorphous  $\text{SiO}_2$  obtained from a process in which silica is reduced to SiO-gas and the reduction

product is oxidized in vapor phase to form amorphous silica. Microsilica may contain at least 70% by weight silica ( $\text{SiO}_2$ ) and has a specific density of 2.1 - 2.3 g/cm<sup>3</sup> and a surface area of 15 - 50 mg<sup>2</sup>/g.

**D. Obviousness-Type Double Patenting Rejection**

Claims 4-7 and 9-10 had been provisionally rejected as being obvious in view of claims 1-8 of copending Application No. 11/718590.

Applicants request that the Examiner hold this Obviousness-type Double Patenting Rejection in abeyance until this case is ready for allowance.

**E. Claim Rejections - 35 USC § 112, First Paragraph**

Claims 4-7, 9 and 10 had been rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite for reciting "resin" or "elastomeric resin" without sufficient antecedent basis.

Applicants respectfully disagree. The preamble of claim 4 recites "a method for production of a highly filled elastomeric compound." The process includes, "forming a highly filled elastomeric compound from an elastomeric resin and a filler..." Claim 4 is submitted to be

definite, clear and fully in compliance with 35 U.S.C. 112, second paragraph, since the term "elastomeric compound" is fully defined, and both instances of the term "resin" are now amended to "elastomeric resin."

In addition, all instances of "resin" in the remaining claims are now amended, where necessary, to "elastomeric resin" thus obviating this ground of rejection as to all pending claims.

**F. Claim Rejections - 35 USC § 103**

Claims 4, 7 and 9-10 had been rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood et al. (US 4,201,060; "Underwood") in view of Emmett (1944, Industrial and Engineering Chemistry).

The Examiner cited Underwood to teach preparing a resin composition having particular amorphous silica as a filler in loadings up to 250 parts per hundred parts of resin. The Examiner also took the position that Underwood teaches that amorphous silica improves the viscosity and enhances processability (citing to Col. 3, lines 7-11; Col. 1, line 64 and Col. 5, lines 45-48), and that other fillers can be added (citing to Col. 13, lines 39-42). The Examiner then argued that, "[i]t would be obvious to one of ordinary

skill in the art to select butadiene-acrylonitrile rubber as the elastomer for preparing the composition of Underwood including PVC and an elastomer."

Applicants respectfully disagree.

As discussed in detail in the previous Response, Underwood does not teach or suggest the claimed methods for production of highly-filled elastomeric compounds, by employing a microsilica (as defined by the claims), as a further component, in addition to a conventional filler, as a modifier to improve processability, and especially viscosity. While Underwood teaches that amorphous silica can be used with one or more other fillers (Col. 13, lines 39-42), there is no teaching or suggestion pointing to how much of the other fillers can be present. There is certainly no teaching or suggestion that the Underwood plasticized PVC be "highly filled" with a conventional filler, such as precipitated silica. The high filler loading increases the viscosity to a level where the processability is strongly reduced, because the composition is too viscous, which makes it impossible to process the composition. The addition of microsilica as a processing agent in the present invention solves this problem.

Underwood does not teach or suggest that microsilica

can be used as a processing agent. Underwood teaches the use of microsilica as a filler replacing conventional filler (calcium carbonate) in PVC. This is evident from all the compositions in the examples of Underwood; see Tables 3, 7, 8, 9 and 10. The advantages of the compositions according to the present invention compared to Underwood is that the present invention makes it possible to use very high amount of conventional filler and maintain excellent processability (e.g., see above discussion of viscosity) by adding microsilica.

In addition, a close inspection of the sections of Underwood cited by the Examiner as discussing "processability" fails to uncover any teaching or suggestion connecting the addition of microsilica to a highly filled elastomer to improve (reduce) viscosity.

The sections noted by the Examiner are as follows:

Col. 3, lines 7-11 discusses "improved surface finish and an improved fire resistance, together with greater resistance to acid."

Col. 1, line 64 discusses properties of the finished product, and then only mentions, "processing characteristics," without elaboration.

Col. 5, lines 45-48, mentions improved processability

relative to the use of calcium carbonate as a filler. Nothing is said about improving the viscosity of a highly filled elastomer.

The Examiner has apparently cited Emmett to teach the addition of filler other than microsilica. This is a semi-reinforcing black in 80 and 100 parts by weight (citing to Table 1, OR-15, OR-25 of Emmett) in the rubber copolymers. Emmett teaches mixtures of plasticized PVC resins with butadiene-acrylonitrile rubbers. However, Emmett, whether taken alone or in combination with Underwood, fails to remedy the clear deficiencies of Underwood, as discussed above.

At best, this rejection amounts to impermissible hindsight reconstruction, since nowhere does Underwood or Emmett, taken in any combination, teach or suggest the method of, e.g., claim 4 which requires the steps of:

- forming a highly filled elastomeric compound...
- adding microsilica [as defined] to the high filled elastomeric compound...[in the defined weight ratios.

It is also submitted that the results provided by the claimed method, in reducing viscosity of a highly filled elastomer resin compound, are unexpected, and that the ordinary artisan would not have considered to take a highly

that Underwood teaches use of thermoplastic elastomer resins that are rubbery material.

Claims 5-6 and 9-10 depend from claim 4 and are therefore patentable as a matter of law for all of the reasons that claim 4 is nonobvious, as discussed above.

For all of these reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claims 4, 7 and 9-10 had been rejected under 35 U.S.C. 103(a) as being unpatentable over Černac et al. (WO 01/8055; "Černac") in view of Underwood (as above).

The Examiner takes the position that Černac teaches a sealing material with less than 60% weight of graphite powder, and 30% weight of mineral fillers including microsilica with a BET surface area of 15 to 25 m<sup>2</sup>/g and a particule size under 5μm, and 12% by weight of elastomeric binders. The Examiner concedes that Černac fails to teach a particular microsilica, but then argues that Underwood remedies this deficiency by teaching a microsilica and certain advantages to this material as a filler.

Applicants respectfully disagree.

While Černac discloses a microsilica, Černac simply does not teach an elastomeric compound. The mixture taught



by Černac is prepared as a liquid slurry with a solid content of only 4%. This slurry is conveyed by a sieve to form a layer that is dewatered by evacuation and pressing, dried and cross-linked in a drying chamber (page 10, second paragraph from bottom). An elastomer with a vulcanization paste is used as a binder. Černac nowhere teaches or suggests the method of e.g., claim 4 which requires the steps of:

- forming a highly filled elastomeric compound...
- adding microsilica [as defined] to the high filled elastomeric compound...[in the defined weight ratios].

Further, Underwood, for all of the reasons given above, fails to remedy any of the deficiencies of Černac as a reference, since Underwood does not teach or suggest preparing a highly filled elastomer compound and blending the microsilica into that highly filled compound.

It is also submitted that the results provided by the claimed method, in reducing viscosity of a highly filled elastomer resin compound, are unexpected, and that the ordinary artisan would not have considered to take a highly filled resin and try to add a microsilica to actually reduce the viscosity.


For all of these reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

**G. Conclusion**

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and such action is respectfully requested. Should any extensions of time or fees be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit account #02-2275.

Respectfully submitted,

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